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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,566	10/23/2003	Ravi Narasimhan	MP0337	3596
26200 7590 12/11/2007 FISH & RICHARDSON P.C. P.O BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER TRAN, KHAI	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 12/11/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/693,566	Applicant(s) NARASIMHAN, RAVI	
	Examiner KHAI TRAN	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 7, 9-11, 16, 19-21, 25, 26, 28-30, 34-36, 40, 41, 43-45, 50-64, 65, 66, 72-75, 81 and 82 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 5, 8, 12-15, 17-18, 22, -23, 27, 31-33, 37-39, 42, 46-49, 67-71, 6-80 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed 3/9/2007 has been entered. Claims 1-82 are pending in this Office action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 6-7, 9-11, 16, 19, 20-21, 25-26, 28, 29-30, 34, 35-36, 40-41, 43, 44-45, 50-51, 55-56, 58, 59-60, 65-66, 72-73, 74-75, 81-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Opera (US 2004/0190636) in view of Li (US 2003/0016621).

Regarding claim 1, Opera discloses a method comprising: transmitting a first training symbol on a plurality of antennas, wherein the first training symbol comprises a plurality of data symbols (see abstract, Figure 1), and wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols (see [0036]); and wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols (see [0013], [0066]).

Opera fails to disclose wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones.

Li discloses wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones (see [0028]-[0029]). It would have been obvious to one having ordinary skill in the art at the time the invention was made to assign each of the plurality of data symbols corresponds to different ones of a plurality of tones as taught by Li into the teachings of Opera in order to enable to achieve the best theoretical performance.

Regarding claim 2, Opera and Li disclose the method further comprising transmitting step of transmitting a second training symbol (N_i) on the plurality of antennas (antenna 1, 120-2),

Regarding claim 6, Opera discloses the transmitting each of the training symbols (or the first training symbol) at least two times (see [0052] wherein the training symbols are periodically transmitted to the receiver).

Regarding claim 7, Opera discloses wherein the plurality of data symbols in the first training symbol are transmitted simultaneously on the plurality of antennas (see Figure 1, [0037]).

Regarding claim 9, Opera discloses wherein the first training symbol comprises an OFMD (orthogonal Frequency Division Multiplexing) training symbol ([0036]).

Regarding claim 10, Opera and Li both disclose a receiver (16,160) for receiving the transmitted signal from the transmitter 10. The limitations of the claim 10 are similar to claim 1. Li further discloses a step of determining a gain at each of the plurality of antennas for each of the plurality of tones ([0067]).

Regarding claim 11, Opera discloses wherein the determining comprises: for each of the plurality of antennas, interpolating values for a plurality of the tones from the corresponding plurality of data symbols received from the antennas (see [0098]).

Regarding claim 14, Opera discloses a step of receiving each of the plurality of data symbols from each the plurality of antennas (see Fig. 1).

Regarding claim 15, Opera discloses a step of performing an Invert Fourier transform on the plurality of data symbols received from each of the plurality of antennas (see [0049]).

Claim 16 is similar to claim 1. Therefore, claim 16 is rejected under a similar rationale.

Claim 19 is similar to claim 9. Therefore, claim 19 is rejected under a similar rationale.

Claim 20 is similar to claim 1. Therefore, claim 20 is rejected under a similar rationale.

Claim 21 is similar to claim 2. Therefore, claim 21 is rejected under a similar rationale.

Claim 25 is similar to claim 6. Therefore, claim 25 are rejected under a similar rationale.

Claim 26 is similar to claim 7. Therefore, claim 26 is rejected under a similar rationale.

Claim 28 is similar to claim 9. Therefore, claim 28 is rejected under a similar rationale.

Claim 29 is similar to claim 10. Therefore, claim 29 is rejected under a similar rationale.

Claim 30 is similar to claim 11. Therefore, claim 30 is rejected under a similar rationale.

Claim 34 is similar to claim 15. Therefore, claim 34 is rejected under a similar rationale.

Claims 35-36 are similar to claims 1-2. Therefore, claims 35-36 are rejected under a similar rationale.

Claims 44-49 are similar to claims 10-15. Therefore, claims 44-49 are rejected under a similar rationale.

Claims 44-45 are similar to claims 10-11. Therefore, claims 44-45 are rejected under a similar rationale.

Claims 50-51 are similar to claims 1-2. Therefore, claims 50-51 are rejected under a similar rationale.

Claims 55-56 are similar to claims 6-7. Therefore, claims 55-56 are rejected under a similar ratio

Claim 58 is similar to claim 9. Therefore, claim 58 rejected under a similar rationale.

Claims 59-60 are similar to claims 1-2. Therefore, claim 59-60 are rejected under a similar rationale.

Claims 65-66 are similar to claims 1, 2, 10. Therefore, claim 65-66 are rejected under a similar rationale.

Claims 72-73 are similar to claim 9. Therefore, claim 72-73 are rejected under a similar rationale.

Claims 74-75 are similar to claims 65-66. Therefore, claim 74-75 are rejected under a similar rationale.

Claims 81-82 are similar to claim 9. Therefore, claim 81-82 are rejected under a similar rationale.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 50-64 are rejected under 35 U.S.C. 101 because: the claims that are directed to computer program.

Allowable Subject Matter

6. Claims 3, 4, 5, 8, 12-15, 17-18, 22-23, 27, 31-33, 37-39, 42, 46-49, 67-71, 76-80 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHAI TRAN whose telephone number is (571) 272-3019. The examiner can normally be reached on 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KHAI TRAN
Primary Examiner
Art Unit 2611